

## SOME STOMATOPOD CRUSTACEANS FROM TULÉAR, MADAGASCAR

By RAYMOND B. MANNING

In 1968 I published a review of the 28 species of stomatopods then known from the island of Madagascar (Malagasy Republic), the Comoro Islands, and Ile Europa. Most of the material that formed the basis for that paper was collected from localities on the northwestern coast of Madagascar, primarily in the vicinity of Nosy Bé. Since the completion of that study, Dr. Raoul DERIJARD, then with the Station Marine de Tuléar, made available for study the collection reported here. This collection is of particular interest in that it comprises representatives of 21 species collected from the vicinity of Tuléar, on the southwestern coast of Madagascar, an area from which little material had been available previously. Further, the collection includes several species not recorded in the previous review: *Alima hyalina* Leach, *Leptosquilla schmettzi* (A. Milne-Edwards), *Lysiosquilla sulcirostris* Kemp, *Pseudosquilla oculata* (Brullé), and an undescribed species of *Acanthosquilla*, named *A. derijardi* below. The collection also includes representatives of two species not recorded from Madagascar proper: *Clorida fallax* (Bouvier) had been recorded from the Comoro Islands and *O. mauritiana* (Kemp) was known from Ile Europa (MANNING, 1968a). Finally, the collections received from Dr. DERIJARD include three species of *Gonodactylus* with associated commensal gastropods, *Caledoniella*.

Since my report on the stomatopods of Madagascar was published, two additional papers relating to the stomatopods from there have come to my attention. DERIJARD (1966) reported on a collection of decapods and stomatopods collected at Ile Europa and noted the occurrence there of *Gonodactylus chiragra* (Fabricius), *G. playsoma* Wood-Mason, and *G. falcatus* (Forskål); all three species are known from Madagascar (MANNING, 1968a). ROSEWATER (1969) reported on some detail on the biology, anatomy and classification of the gastropods commensal with *Gonodactylus*, *Caledoniella montrouzieri* Souverbie, based on material from Madagascar.

Station data for all materials and an annotated list of species are summarized in Table 1. Most of the species in the collection have been recorded from Madagascar (MANNING, 1968a) and require no further comments. Descriptive notes on the new records and the new species of *Acanthosquilla* are given below in the Systematic Account.

Terms and measurements used in the descriptive accounts have been described in detail in earlier papers (MANNING, 1968a). All materials are from shallow water (0 meter) unless a depth in fathoms (fms) or meters (m) is specified; depths are given as indicated on each label. Most specimens have been deposited in the Muséum national d'Histoire naturelle, Paris; duplicates have been retained for the Division of Crustacea, Smithsonian Institution (USNM).

Table 1. — Station data and list of species from Tuléar

Species	Number of Specimens	Location	Substrate	Depth	Date	Remarks
<b>SQUILLIDAE :</b>						
<i>Clorida chlorida</i> (Brooks).....	— 1♀	D-42 ; 23°25'35"S, 43°41'07"E	mud, with gravel of organic origin (shells)	10 m	13-ix-1963	—
<i>Clorida fallax</i> (Bouvier) .....	1♂ —	D-2 ; 23°21'50"S, 43°38'20"E	muddy sand	10 m	14-viii-1963	New record for Madagascar
» » » .....	— 1♀	D-55 ; 23°21'56"S, 43°38'09"E	sandy mud	14 m	28-ix-1963	—
<i>Leptosquilla schmeltzii</i> (A. Milne-Edw.) .	7♂ 6♀	D-2 ; 23°21'50"S, 43°38'20"E	muddy sand	10 m	14-viii-1963	New record for Madagascar
» » » .....	— 2♀	D-42 ; 23°25'35"S, 43°41'07"E	mud, with gravel of organic origin (shells)	10 m	13-ix-1963	—
» » » .....	1♂ —	D-57 ; 23°21'30"S, 43°37'57"E	muddy sand	16 m	28-ix-1963	—
<i>Harpiosquilla harpax</i> (de Haan).....	— 1♀	Nosy Vato	fine sand	littoral	8-v-1965	—
<i>Alima hyalina</i> Leach .....	— 1♀	Grand Récif	coarse sand	littoral	7-viii-1965	New record for Madagascar
» » » .....	2♂ 2♀	Grand Récif	plants, dunes	littoral	25-iv-1967	» »
<i>Oratosquilla gonyptetes</i> (Kemp) .....	1♂ —	D-57 ; 23°21'30"S, 43°37'57"E	muddy sand	16 m	28-ix-1963	—
<i>Oratosquilla hesperia</i> (Manning) .....	1♂ 2♀	Grand Récif	plants	littoral	-vi-1964	—
<i>Oratosquilla mauritiana</i> (Kemp) .....	1♂ —	Grand Récif	plants	littoral	-vi-1964	New record for Madagascar
» » » .....	1♂ —	Nosy Vato	fine sand	littoral	18-vii-1965	» »
<i>Oratosquilla nepa</i> (Latreille) .....	1♂ —	Grand Récif	plants, coarse sand	littoral	4-vi-1966	—

Species	Number of Specimens	Location	Substrate	Depth	Date	Remarks
<b>LYSIOSQUILLIDAE :</b>						
<i>Acanthosquilla derijardi</i> n. sp. ....	— 1♀	Grand Récif	coral and sand, friable flat	littoral	16-ix-1966	New species
<i>Lysiosquilla maculata</i> (Fabricius) ....	1♂ —	Grand Récif	coarse sand	littoral	5-v-1965	—
<i>Lysiosquilla sulcirostris</i> Kemp ....	1♂ —	Grand Récif	plants, coarse sand	littoral	25-iv-1967	New record for Madagascar
<b>GONODACTYLIDAE :</b>						
<i>Odontodactylus scyllarus</i> (Linnaeus)....	— 1♀	Tuléar	sandy mud	—	-v-1967	—
<i>Pseudosquilla ciliata</i> (Fabricius) ....	— 1♀	D-7 ; 23°22'09"S, 43°38'35"E	sand	12 m	27-viii-1963	—
» » » ....	4♂ 4♀	Tuléar	plants	littoral	-vi-1967	—
» » » ....	1♂ 1♀	Ifaty	plants, mud	littoral	28-ix-1965	—
<i>Pseudosquilla oculata</i> (Brullé).....	1♂ —	Ifaty	under rocks	littoral	14-ii-1967	New record for Madagascar
<i>Gonodactylus chiragra</i> (Fabricius)....	— 1♀	Ifaty	plants, muddy sand	littoral	28-ix-1965	—
<i>Gonodactylus platysoma</i> Wood-Mason..	— 1♀	Sarodrano	under rocks	littoral	20-ix-1967	With <i>Caledoniella</i>
<i>Gonodactylus smithii</i> Pocock.....	7♂ 11♀	Sarodrano	under rocks, reef	littoral	24-ix-1967	With <i>Caledoniella</i>
<i>Gonodactylus falcatus</i> (Forskål) .....	2♂ —	Ifaty	plants, muddy sand	littoral	28-viii-1965	With <i>Caledoniella</i>
<i>Gonodactylus lanchesteri</i> Manning.....	1♂ —	Ifaty	plants, muddy sand	littoral	28-viii-1965	—
» » » ....	4♂ 2♀	Sarodrano	rocks	littoral	26-ix-1967	—
» » » ....	— 1♀	Grand Récif	under rocks	littoral	17-vii-1965	—
<i>Haptosquilla lenzi</i> (Holthuis).....	— 1♀	Grand Récif	coral and sand, friable flat	littoral	15-iv-1967	—

I am indebted to Dr. Raoul R. DERIARD, now with the Compagnie Générale Transatlantique, Abidjan, Ivory Coast, for allowing me to work with this collection which he assembled while at the Station Marine de Tuléar. Dr. M. PICHON, Station Marine d'Endoume, Marseille, kindly forwarded station data for several of the samples, for which I thank him. The illustrations are by my wife Lilly.

## SYSTEMATIC ACCOUNT

### Family SQUILLIDAE

*Alima hyalina* Leach, 1817  
(Figure 1)

*Alima hyalina*. — MANNING, 1969a, p. 128, fig. 37, 38, 39a [references].

MATERIAL. — 1 ♀, 28 mm; Grand Récif, Tuléar; coarse sand; 7 August 1965; USNM. — 2 ♂, 25-31 mm; 1 ♀, 29 mm; Grand Recif, Tuléar; plants, dunes; 25 April 1967. — 1 ♀, 35 mm; same; USNM.

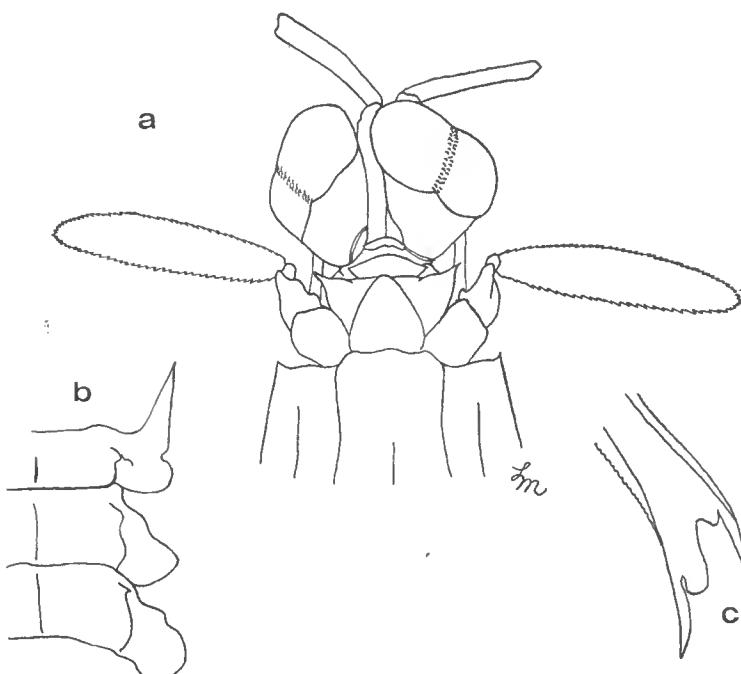


FIG. 1. — *Alima hyalina* Leach, female, TL 28 mm, Grand Récif, Tuléar: a, anterior portion of body; b, lateral processes of fifth, sixth and seventh thoracic somites; c, basal prolongation of uropod.

DIAGNOSIS. — Carapace with short anterolateral spines, median carina lacking anterior bifurcation; mandibular palp absent; dactylus of raptorial claw with six teeth; four epipods present; both lobes of lateral process of fifth thoracic somite in same plane; anterior five abdominal somites with eight carinae; two rounded lobes present between spines of basal prolongation of uropod.

DISCUSSION. — These specimens constitute only the third record of adults of this species from the Indo-West Pacific area, from which larval stages have been recorded several times (GURNEY, 1946). EDMONDSON (1921) and TOWNSLEY (1953) both recorded the species from Hawaii, and it was subsequently recorded from South Africa by BARNARD (1950) and INGLE (1958).

The color pattern of the specimens in the larger lot are similar to that recorded for the species from other localities (INGLE, 1958; MANNING, 1969a). The Corneal Indices of these specimens are similar to those recorded from Atlantic specimens by MANNING (1969a).

When first revived (MANNING, 1968b), the genus *Alima* was believed to include six species. Since then I have shown that two of the nominal species, *Squilla hildebrandi* Schmitt, 1940, and *Squilla labadiensis* Ingle, 1960, must be identified with *S. hieroglyphica* Kemp, 1911 (MANNING, 1969a). All four of the species in *Alima* occur in the Indo-West Pacific region, but two, *A. hyalina* and *A. hieroglyphica*, also occur in the Atlantic. A key to the species of *Alima* is presented below.

DISTRIBUTION. — Atlantic Ocean and Indo-West Pacific region, from Hawaii, Madagascar, and South Africa. It has not been recorded previously from Madagascar.

#### KEY TO SPECIES OF *ALIMA*

1. Mandibular palp present; anterior 5 abdominal somites with median carina. .... *Alima supplex* (Wood-Mason, 1895); India.
2. Mandibular palp absent; abdominal somites lacking median carina..... 2
- 2(1). Median carina of carapace with well developed anterior bifurcation.....  
..... *Alima laevis* (Hess, 1865); Australia.
- Median carina of carapace lacking well developed anterior bifurcation.... 3
- 3(2). Dactylus of claw with 6 teeth; lobes of lateral process of fifth thoracic somite in same plane; 2 rounded lobes between spines of basal prolongation of uropod..... *Alima hyalina* Leach, 1817; Indo-West Pacific, Atlantic.  
Dactylus of claw with 5 teeth; anterior lobe of lateral process of fifth thoracic somite lower than posterior lobe, 1 rounded lobe between spines of basal prolongation of uropod.....  
..... *Alima hieroglyphica* (Kemp, 1911); Indo-West Pacific, Atlantic.

#### *Leptosquilla schmeltzii* (A. Milne-Edwards, 1873)

*Squilla schmeltzii*. — HOLTHUIS, 1941, p. 257, fig. 2 [older references]. — MANNING, 1968b, p. 122 [listed].

*Leptosquilla schmeltzii*. — HOLTHUIS, 1967a, p. 13.

MATERIAL. — 7 ♂, 9-15 mm; 6 ♀, 11-16 mm; 23°21'50"S, 43°38'20"E; Sta. D-2; muddy sand; 10 m; 14 August 1963; USNM. — 2 ♀, 16-18 mm; 23°25'35"S, 43°41'07"E; Sta. D-42; mud, with gravel of organic origin (shells); 10 m; 13 September 1963. — 1 ♂, 14 mm; 23°21'30"S, 43°37'57"E; Sta. D-57; muddy sand; 16 m; 28 September 1963.

DISCUSSION. — These specimens, the first record of this species from Madagascar, agree well with the accounts of the species given by HOLTHUIS (1941, 1967a). All of the specimens have six teeth on the claw and two rounded lobes between the spines of the basal prolongation of the uropod. There are three or four movable spines on the uropodal exopod, the distal two spatulate, and four, five or six fixed spines on the inner margin of the basal prolongation of the uropod.

In the generic diagnosis given by me in 1968b for *Leptosquilla*, I stated that *L. schmeltzii* had four epipods. I take this opportunity to correct this error. HANSEN (1926) reported but one epipod, but all of the specimens from Madagascar have two.

In 1968b I suggested that there might be two distinct species in the genus, based on discrepancies between the accounts of *L. schmeltzii* given by HOLTHUIS (1941) and HANSEN (1926). In the figures of the uropod, HOLTHUIS showed two rounded lobes between the spines of the basal prolongation of the uropod, whereas HANSEN showed but one. In other respects their accounts agree so closely with the specimens from Madagascar that I must conclude that HANSEN's figure is somewhat stylized.

HOLTHUIS (1941, 1967a) commented on the differences in the structure of the telson in males and females, especially the broadly inflated median carina of the telson in adult males. The male from Station D-57, TL 14 mm, shows no sign of the inflated median carina, but the median carinae on the telsons of males from station D-2, TL 12-15 mm, are noticeably inflated, more so on the larger specimens.

DISTRIBUTION. — Indo-West Pacific region, from Samoa, the Lesser Sunda Islands, the Andaman Islands, Mauritius, Madagascar, and the Red Sea. It has not been recorded previously from Madagascar.

#### Family LYSIOSQUILLIDAE

##### ***Acanthosquilla derijardi* new species** (Figure 2)

*Lysiosquilla multifasciata*. — TWEEDIE, 1949, p. 39, fig. 1 [not *L. multifasciata* Wood-Mason, 1895].

HOLOTYPE. — 1 ♀, 44 mm; Grand Récif, Tuléar; friable flat, on coral and sand; 16 September 1966; R. DERIJARD, coll.

PARATYPES. — 2 ♂ (1 damaged, other 51 mm); 1 ♀, 43 mm; Tinakta Island, Tawi Tawi Group, Sulu Archipelago, Philippine Islands; 05°10'15"N, 119°53'E; 16 fms; fine sand, black sponge; Albatross Station D. 5161; 22 February 1908; USNM 127452.

DESCRIPTION. — Eye small, not extending to end of antennular peduncle; cornea small, expanded slightly beyond stalk, faintly bilobed; ocular scales erect but inclined anteriorly, rounded, separate.

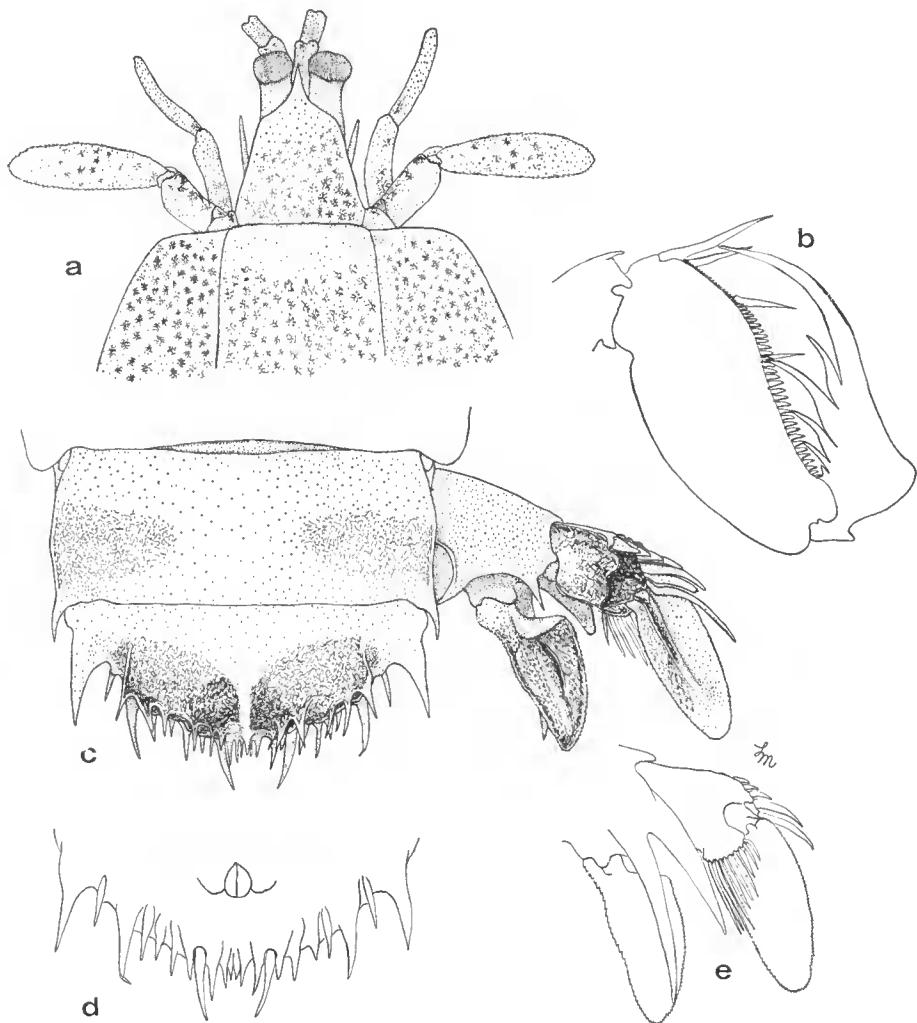


FIG. 2. — *Acanthosquilla derijardi* new species, female holotype, TL 44 mm, Grand Récif, Tuléar : a, anterior portion of body (setae omitted); b, raptorial claw; c, sixth abdominal somite, telson, and uropod; d, telson, ventral view; e, uropod, ventral view (setae omitted).

Antennular peduncle short, less than half as long as carapace, densely clothed in setae; dorsal processes of antennular somite visible lateral to rostral plate as slender, anteriorly directed spines.

Antennal peduncle densely setose, particularly on mesial margin, with one ventral papilla; antennal scale slender, short, less than half as long as carapace.

Rostral plate subsimilar to that of *A. multifasciata*, overall shape trapezoidal, basal portion tapering distally, anterolateral angles rounded, apex a slender spine.

Carapace narrowed anteriorly, rounded anterolaterally and posterolaterally, lacking spines, carinac, or cervical groove.

Raptorial claw stout; dactylus with six teeth, penultimate shorter than antepenultimate, proximal tooth very small; outer margin of dactylus as in *A. multifasciata*, with small proximal lobe and much larger distal lobe; opposable margin of propodus pectinate, with four slender movable spines proximally on inner margin, second smallest; opposable margin of propodus with few short setae on proximal half; dorsal ridge of carpus terminating in slender spine; merus much longer than ischium.

Propodus of third thoracic appendage broader than long, that of fourth appendage as broad as long, both with inferior ribbing; propodus of fifth thoracic appendage as broad as long, with inferior brush of setae.

Mandibular palp and five epipods present.

Exposed thoracic somites smooth, lateral margins rounded or subtruncate; basal segment of each walking leg unarmed; endopods of walking legs two segmented, subcircular on first two legs, more ovate on third, eighth thoracic somite without noticeable ventral keel.

Abdomen depressed, loosely articulated, somites broad, smooth, unarmed except for long spines at posterolateral angle of sixth; sixth somite with prominent ventral projection overhanging articulation of each uropod, each projection with rounded lobe basally on mesial surface; ventral surface of sixth somite unarmed.

Telson broader than long, usual dorsal fan of five teeth replaced by more ornate dorsal armature, consisting of median spine and two pairs of lateral groups of spines, each comprising 1-5 spines; marginal armature consisting of (on either side of midline) 3-4 submedian denticles, innermost higher and smaller than outermost, a movable submedian tooth, four intermediate denticles, one intermediate tooth, one lateral denticle, and one lateral tooth; size of intermediate denticles variable, second and fourth largest in holotype, third largest in female paratype; ventral surface of telson unarmed, but with short, rounded transverse carina on each side of anal pore.

Uropod with 6-7 slender movable spines on outer margin of proximal segment of exopod, distalmost usually extending to or beyond midlength of distal segment; 5-10 slender, stiff setae present on inner distal lobe of proximal segment of exopod; endopod triangular, with strong dorsal carina and prominent fold on outer proximal margin; spines of basal prolongation of uropod trefoil in cross-section, inner the longer.

**COLOR.** — *Acanthosquilla derijardi* exhibits the overall banded color pattern which is characteristic of many of the species in the genus. There are scattered single dark chromatophores on the rostral plate and anterior appendages imparting a speckled appearance to the anterior portion of the body. The carapace is marked with two dark bands, the anterior broad, diffuse, the posterior narrower, with pigment concentrated at the posterolateral angles. The posterior three thoracic somites are each marked posteriorly with a curved band of light chromatophores. Each of the anterior five abdominal somites has a dark band, interrupted in some specimens, usually with a narrow, very dark median

portion and two lighter lateral portions, broadening ventrolaterally. The posterolateral angles of the fifth abdominal somite are very dark, almost black, and there is a light lateral patch of chromatophores on each side of the sixth abdominal somite. The telson is marked with two broad distal patches of dark pigment, separated medially by a narrow clear area on the median dorsal spine. The basal segment of the uropod is light, but the entire proximal segment as well as the inner half of the distal segment of the exopod, most of the endopod, and the outer spine of the basal prolongation of the uropod are black.

**MEASUREMENTS.** — The single intact male is 51 mm long; the two females reported here are 43 and 44 mm long, and TWEEDIE's specimen from British North Borneo measured 75 mm in length. Other measurements, in mm, of the female holotype, TL 44 mm: carapace length 8.2; cornea width 1.0; rostral plate length 3.0, width 2.5; fifth abdominal somite width 9.1; telson length 3.1, width 7.0.

**REMARKS.** — The large female specimen, TL 75 mm, from Sandakan, British North Borneo recorded by TWEEDIE (1949) as *A. multifasciata*, is here identified with *A. derijardi*. His account agrees well with the specimens reported here.

*Acanthosquilla derijardi* is the sixth species of the genus to be recorded from the Indo-West Pacific region. It can be distinguished from all species now recognized in the genus by the dorsal armature of the telson, in which the pairs of lateral dorsal spines are replaced by two pairs of groups of spines, each comprising 1-5 spines. The distribution of these spines is as follows:

	Submedian	Lateral
♀ holotype .....	3-5	3-3
♀ paratype .....	1-4	2-3
♂ paratype .....	1-2	2-2
♀ (TWEEDIE) .....	2-2	3-3

Variation in the number of spines in each group does not seem to be a function of sex or size; the holotype, TL 44 mm, has more spines in the submedian group and the same number in the lateral group as does the specimen reported by TWEEDIE from Borneo, a female 75 mm in length. The configuration of spines on the male and female paratypes is very similar.

Morphologically, *A. derijardi* closely resembles *A. multifasciata* (Wood-Mason), including the shape of the rostral plate, the enlarged distal lobe on the outer margin of the dactylus of the claw, and the small number of submedian denticles arranged in an oblique row on the telson. Although the shape and size of the intermediate denticles of the telson are similar in the two species, these features are more variable in *A. derijardi*. In the holotype, the second and fourth denticle (from the midline) are larger than the first and third, but in the female paratype the first denticle is the smallest, the third is the strongest.

The paratypes and also TWEEDIE's specimen are very similar to the holotype. The rostral plate of the damaged male paratype is noticeably longer than that of the holotype; in the intact male paratype the ophthalmic somite is more elongated than in any other specimens so that the ocular scales are visible at the base of the rostral spine. On the intact male paratype, the proximal spine on the dactylus of the raptorial claw is larger than that of the remaining specimens examined; in all of the other specimens reported here and TWEEDIE's specimen as well the proximal tooth resembles a low denticle. All of the specimens examined are densely setose anteriorly.

The species is named for Raoul R. DERIJARD, formerly of the Station Marine de Tuléar, who made the collection reported here available for study.

DISTRIBUTION. — Indo-West Pacific region, from the Philippine Islands; Sandakan, British North Borneo; and Tuléar, Madagascar. Shallow water to 16 fathoms.

*Lysiosquilla sulcirostris* Kemp, 1913  
(Figure 3)

*Lysiosquilla maculata* var. *sulcirostris* Kemp, 1913, p. 116, pl. 8 (fig. 92-93).

*Lysiosquilla sulcirostris*. — HOLTHUIS, 1967b, p. 23 [synonymy]. — ALIKUNHI, 1968, p. 910, fig. 168-173 [larval and postlarval development].

MATERIAL. — 1 ♂, 41 mm; Grand Récif, Tuléar; between buoys, coarse sand, plants; shallow water; 25 April 1967.

DIAGNOSIS. — Rostral plate triangular or pentagonal, not cordiform, length and width subequal or length greater, with short median carina on anterior fourth flanked laterally by deep longitudinal groove; antennal peduncle lacking anterior projection; antennal scale broad, length about two and onehalf times greatest width; dactylus of claw with 8-9 teeth, dorsal tooth of carpus not deflexed; ventral keel of eighth thoracic somite rounded; sixth abdominal somite and telson smooth dorsally; basal segment of uropod unarmed ventrally at articulation of endopod.

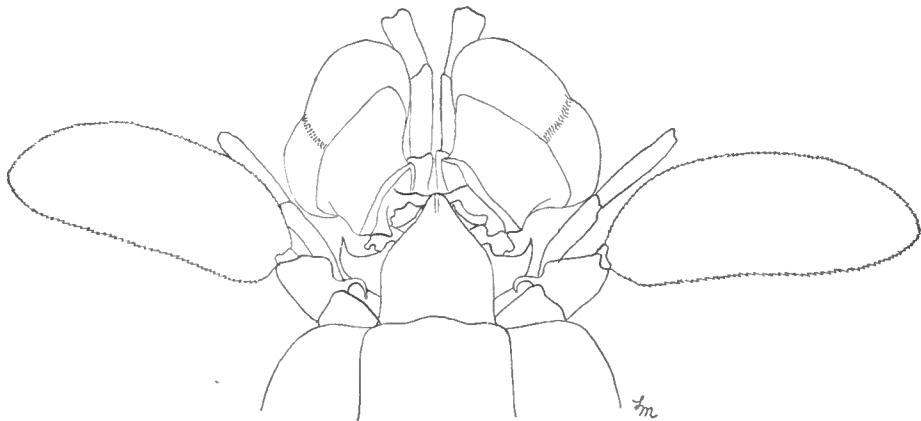


FIG. 3. — *Lysiosquilla sulcirostris* Kemp, male, TL 41 mm, Grand Récif, Tuléar: anterior portion of body (setae omitted).

COLOR. — Most of the pigment pattern has faded, but a few narrow dark bands are visible on the body. There are three bands on the carapace and one on the posterior margin of the posterior three thoracic and anterior five abdominal somites; the sixth abdominal somite is marked posterolaterally by dark spots at the articulation of the telson. A pair of brown patches are present on the posterolateral dorsal surface of the telson. The uropod is marked with a dark spot dorsally on the basal segment, a dark spot at the articulation of the two segments of the exopod, and a subcircular spot on the endopod.

REMARKS. — I have no hesitation in identifying this juvenile specimen with *L. sulcirostris*. The characteristic shape of the rostral plate and the small number of teeth (8-9) on the raptorial claw will immediately distinguish this species from all other species in the genus.

In 1968a I reported on specimens of both *L. maculata* (Fabricius) and *L. tredecimdentata* Holthuis from Madagascar and showed that the shape of the antennal scale was among the features which could be used to distinguish the two species. In *L. maculata* the scale is broad, its length more than twice its greatest width; it is also marked by a central patch of diffuse, dark chromatophores. In *L. tredecimdentata* the scale is slenderer, its length about three times its greatest width; it is covered with scattered dark chromatophores. The scale of the specimen of *L. sulcirostris* reported here is broad, resembling that of *L. maculata*; unfortunately I cannot determine its color pattern.

K. H. ALIKUNHI (1968) has given accounts of the final pelagic larvae and postlarvae of two species of *Lysiosquilla* from off Madras, India, which he identified as *L. maculata* and *L. sulcirostris*. He pointed out that the antennal scale of juveniles of the latter species lacked a dark border, but had several dark chromatophores on the surface. The juvenile reported here agrees with his account in most features, the only major difference being in the number of submedian denticles present on the telson, 20-21 pairs in the Madras material, 18 pairs in the specimen from Madagascar.

In Table LXVII, ALIKUNHI (1968, p. 914) summarized distinguishing features of juveniles of comparable age of *L. maculata* and *L. sulcirostris*. He reported that the specimen of *L. maculata* had 10-12 teeth on the raptorial claw, a conspicuous curved spine on the carpus of the claw, and a well marked dark pigment pattern; he also indicated (p. 905 and fig. 166) that there was a spine present on the inner basal aspect of the ventral surface of the uropod. All of these are characteristic features of *L. tredecimdentata* rather than *L. maculata* and it is highly likely that ALIKUNHI was working with material of the former species or a mixture of both. Of interest is that fact that adults of *L. tredecimdentata* have not been recorded east of Karachi, West Pakistan, although they have been recorded from a few localities between the Red Sea and South Africa (TIRMZI and MANNING, 1968; MANNING, 1969c).

*L. sulcirostris* is an Indo-West Pacific species which is known from a few localities between India and Japan (HOLTHUIS, 1967b). It has not been recorded previously as far west as Madagascar.

#### Family GONODACTYLIDAE

##### *Pseudosquilla oculata* (Brullé, 1837)

MATERIAL. — 1 ♂, 44 mm; reef, Ifaty; under rocks; 14 March 1967.

REMARKS. — The color pattern of this small male has largely faded, but the dark circles on the carapace, the dark paired ventral spots on the sixth, seventh, and eighth thoracic somites, and the dark spot proximally on the ventral surface of each uropod, are all visible.

This is the first Madagascar record of this species, which has a wide range

in the Indo-West Pacific region and the Atlantic Ocean as well; it has been recorded from Mauritius.

#### Commensal associates of species of *Gonodactylus*

In the earlier report on the stomatopods of Madagascar, I reported that two species of *Gonodactylus*, *G. platysoma* and *G. smithii* Poecock, had commensal gastropods associated with them. Dr. Joseph ROSEWATER, Division of Mollusks, National Museum of Natural History, studied these specimens in more detail and in 1969 published a detailed account of these mollusks, *Caledoniella montrouzieri* Souverbie. Three species of *Gonodactylus* from the collection reported here have specimens of *Caledoniella* associated with them; the mollusks were found on the same two species reported by me in 1968a as well as on *G. falcatus* (Forskål).

Egg masses of *Caledoniella* were found on four specimens of *G. smithii* from Sarodrano; the lot comprised seven males and 11 females. Four loose gastropods were found in the jar; one stomatopod had one gastropod attached anteriorly, and one had two specimens attached, one anteriorly and one posteriorly. One of two male specimens of *G. falcatus* from Ifaty had two gastropods attached to it; the other showed no signs of infection. Finally, there was one gastropod loose in the jar with *G. platysoma* from Sarodrano. Neither of the specimens of *G. falcatus* or of *G. platysoma* had any eggs attached to the pleopods.

ROSEWATER (1969) observed that the smaller male gastropods were attached anteriorly on the ventral surface of the thorax of the stomatopod, whereas the larger female was always found posteriorly. In cases in which the attachment could be observed in the specimens reported here, the smaller specimens were always attached anteriorly, and always on the ventral surface of the thorax.

More detailed observations on the specimens of *Caledoniella* are planned by Dr. ROSEWATER.

It is of interest to note that the gastropods apparently are associated only with the larger species of *Gonodactylus* from Madagascar, *G. smithii*, *G. platysoma*, and *G. falcatus*; they have not been found associated with the fourth large species known from there, *G. chiragra*, which may serve as a host in other areas in the Indo-West Pacific region (ROSEWATER, 1969). The mollusks have not been found with any of the five smaller species of *Gonodactylus* known from Madagascar, nor with any of the four other small species of the genus now known from the Indo-West Pacific region (MANNING, 1967).

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